

DATE: April 22, 2005

TO: Region Engineers
Region Delivery Engineers
TSC Managers
Resident/Project Engineers
Region Construction Engineers

FROM: Larry E. Tibbits
Chief Operations Officer

John C. Friend
Engineer of Delivery

SUBJECT: Bureau of Highway Instructional Memorandum 2005-05
Frangible Light Standard Transformer Base

Recently, all frangible light standard transformer bases along state trunklines were inspected throughout the state. Based on the findings, the attached Special Provision for Frangible Light Standard Transformer Base is approved for use in projects advertised after March 1, 2005. After FHWA approval, the special provision will be added to the Frequently Used Special Provision lists with the following use statement, "Use on all projects with frangible light standard transformer bases."

In order for any frangible light standard transformer base to be used, it must be evaluated according to the attached Qualification Procedure for Frangible Light Standard Transformer Base Assembly and be listed in the Material Source Guide Qualified Product List. Suppliers of frangible light standard transformer bases must submit the required documentation immediately, as outlined in the qualification procedure.

Effective immediately, steel shaft foundations are not permitted for any light supports, including retrofitting installations.

If you have any questions, please contact the following Construction and Technology Support Area staff for assistance:

- Special Provision and Qualification Procedure Steve Kahl 517-322-5707
- Qualified Products List and Materials Source Guide Steve Purdy 517-322-5665

Chief Operations Officer

Engineer of Delivery

BOHD:C/T:RDT:kab

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Attachments

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MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
FRANGIBLE LIGHT STANDARD TRANSFORMER BASE

C&T:SCK

1 of 2

C&T:APPR:RDT:SJC:03-14-05

a. Description. This special provision covers installation and material requirements for frangible light standard transformer bases.

b. Materials. Use only frangible transformer bases from the MDOT Qualified Products List (QPL). The frangible transformer base must meet the requirements for breakaway supports listed in Section 12 of the 2001 American Association of State Highway and Transportation Officials (AASHTO) *“Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.”* Furnish each base with four bolts, hex nuts, washers, and lock washers according to subsection 918.08.C of the Standard Specifications for Construction. Use foundation anchor bolts according to subsection 918.07.C, include lock washers. Galvanize bolts, nuts, washers, and lock washers according to subsection 908.15.B.

c. Construction. Install frangible transformer bases according to subsection 819.03, and the requirements herein. Install frangible transformer base on concrete foundations with a level top surface within a 1:480 slope. Steel shaft foundations are not permitted. Mount the frangible base directly on the concrete foundation and secure to the anchor bolts according to the frangible transformer base manufacturer's installation instructions. Use lock washers. Do not use leveling nuts. Mount the frangible transformer base to the concrete foundation so that the tabs project a minimum of ½ the anchor bolt diameter beyond the nut. Complete the anchor bolt installation and tightening according to subsections 810.03.N.1, 810.03.N.2.b, and 810.03.N.2.c.

Tighten bolts connecting the pole to the frangible base to a snug tight condition according to subsection 707.03.D.7. Use lock washers. Do not use bolt or nut covers.

Use a beveled washer to compensate for slope greater than 1:40 on surfaces of bolted parts in contact with the bolt head and nut according to subsection 810.03.N.2.c.

d. Disbursement. The Engineer shall withhold in reserve an amount equal to 40 percent of the total contract value for the following pay items: *Light Std, Frangible Transformer Base and Light Std Fdn.*

e. Inspection. After the Contractor has complied with the requirements as stated in this special provision, the Contractor shall notify the Engineer in writing requesting final inspection. The Engineer will have 21 calendar days from receipt of Contractor's written request to schedule and complete all inspections. The Engineer shall contact the Construction and Technology Division, Structural Fabrication Engineer at (517) 322-1235, to schedule and conduct the inspection. Inspections shall be according to subsections 707.03.D.7.c, 810.03.N.1, 810.03.N.2.b, 810.03.N.2.c, 819.03 and this special provision.

f. Reporting. The Structural Fabrication Engineer shall notify the Engineer within the 21 calendar day inspection period relative to acceptance or rejection of any items. Written inspection reports will be provided to the Engineer within the 21 calendar day inspection period.

Any rejectable items found shall be corrected according to subsections 707.03.D.7.c, 810.03.N.1, 810.03.N.2.b, 810.03.N.2.c, 819.03 and this special provision at the Contractor's expense.

g. Measurement and Payment. The payment to furnish all labor, materials, tools, equipment, and incidentals for installation shall be included in the pay item(s) *Light Std, Frangible Transformer Base* and *Light Std Fdn*.

No extension of time and/or additional compensation shall be granted to the Contractor for delays resulting from the Contractor's failure to notify the Engineer in writing of the need for inspection, or any delays associated with the specified 21 calendar day inspection period. Payment of the amounts held in reserve for the pay items listed above can only be made after the Engineer has received notification of acceptance of the items inspected from the Structural Fabrication Engineer.

Other contract items (pay items) in subsection 819.04 for light standard installation shall be paid for separately.

**Qualification Procedure
For
Frangible Light Standard Transformer Base Assembly**

1. Scope

- 1.1 This document covers the qualification procedures for Frangible Light Standard Transformer Base Assembly for placing luminaries in the roadway clear zone. It includes the procedures to be followed by manufacturers or suppliers in order to have their products included on MDOT's Qualified Products List (QPL).
- 1.2 MDOT reserves the right to randomly sample product from lots or jobsite as required to verify conformance.

2. Submittal Procedure

- 2.1 Submit a cover letter and a frangible light standard transformer base along with the required information listed in Section 2.2 for each product to the MDOT address listed below. The cover letter should state the name of the designated company contact person to whom inquiries may be made.
Mail to:

Structures Unit, Experimental Studies Group
Construction & Technology Division
8885 Ricks Road
P.O. Box 30049
Lansing, Mi 48909

- 2.2 *Product Data Sheets* - Include product literature describing the product's use and other pertinent information such as manufacturer's name and address, model & lot number, dimensional sheets, hardware, material composition, and the following information:
 - 2.2.1 Certification that the product is crash worthy to the requirements of NCHRP Report 350 Test Level 3, and meets the additional requirements of the American Association of State Highway and Transportation Officials (AASHTO) "*Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*" Section 12, Breakaway Supports.
 - 2.2.2 Submit a copy of the FHWA approval letter for the product use on the National Highway System. Provide certification that the product

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submitted has the same chemistry, mechanical properties, and geometry as the FHWA approved product.

2.2.3 Submit a copy of the test report by an independent facility of the dynamic performance (crash) test outlined in the standards in 2.2.1 above.

2.2.4 Provide clear instructions for installation, including base bolt size, anchor bolt size, washer configuration and material, distance base tabs project beyond the nut for the specified bolt circle, and nut tightening procedures. Lock washers must be included with the base bolts and anchor bolts.

2.2.5 Provide information on the design strength of the frangible light standard transformer base, including maximum pole mounting height and weight, and ability to carry the loads as specified in AASHTO *“Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals”* Section 3, Loads.

3. Evaluation

3.1 **Certified to meet NCHRP Report 350 and AASHTO dynamic performance criteria.**

3.2 Frangible light standard transformer bases must conform to the dimensional tolerances given in the FHWA approved drawing submitted in section 2.2. The base tabs must project a minimum of ½ the anchor bolt diameter beyond the nut for the specified bolt circle. Base tabs must be able to withstand snug tightening with a lock washer and a 1:20 beveled washer in place without damage.

3.3 Completed submittals will be evaluated by MDOT throughout the year. The submitted information will be reviewed for conformance to the specified requirements. If the product meets the requirements, it will be included on the QPL. The submitter will be notified in writing concerning the results of the evaluation. MDOT reserves the right to verify submitted test information or re-evaluate a product at any time by conducting its own tests.

4. Disqualification

4.1 A product may be removed immediately from the QPL if any problems develop related to installation or performance. The submitter will be notified in writing of the effective date of product removal.

5. Requalification

- 5.1 A product which has been disqualified and removed from the QPL will be considered for re-evaluation only after submittal of a written request along with acceptable evidence that the problems causing the disqualification have been corrected. The requirements for qualification, as specified in this document, also apply for requalification of the product at the qualification period.